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questions at bottom, and do not seem to be incapable of solution with a little careful thought and experimentation. The solution of all questions of this nature can come only when the various lines of biological research indicated in this paper are completed.

*Origin of the Fittest.* COPE.

In this connection the final chapters of this work offer many suggestive ideas. The earlier part of the work calls attention to the important phenomenon termed "acceleration," by which is meant that every time an ontogeny is repeated the characters appear at earlier and earlier periods, or in other words the developmental history is compressed to give room for the later added acquirements.

*Begriff und Sitz der Seele.* SCHMIDT. Heidelberg, 1887.

What is the seat of the soul? Is it a point or in a special portion of the body? If so, where? Or is it diffused wherever there is idioplasm? We first consult Schmidt. There are three forms of biological force, contends Schmidt, more and more unified, or active at a point, as we ascend the scale, viz., unconscious mind in the plant, consciousness in the animal, and self-consciousness in man. If the soul is the life of the body there must be a central point of life, and this he finds to be the *Nœud vital* of Flourens, because a destruction of the gray matter at the point of the *calamus* causes instant death. Here is the center to which cell sensations are carried, and from which all mandates of will are sent forth. He even indicates the paths by reference to Fick's "Phantom Brain!" Organisms begin in a mathematical point; the embryo is not formed from all the cells of the morula, but from a central point corresponding with the central point of the *germinal vesicle*. In the adult the *Nœud vital* is the center of the body, (the head representing concentrated segments). It is scarcely necessary to comment upon this theory. The author is not well enough versed in anatomy, embryology or physiology to know that not any of his statements are significant, and most are sadly erroneous. Death from the destruction of the structures in the *Nœud vital* ensues because the heart and breathing movements are innervated from these points. There is no proof whatever that consciousness resides here.

*Von dem Materiellen der Seele.* HITZIG, 1886.

This is a popular address calling attention to such facts as the increased circulation in the brain during mental work, the effect of drugs on conscious states, the effects of the removal of parts of the surfaces of the hemispheres, etc., to show that there is a material substratum for mind. The difference between man and animals lies in the power of the former to reason abstractly, while the latter depend on direct sensations. This difference is probably due to a difference of organization of the brain. If we are evolutionists we can look hopefully to the future, when the soul shall have made as great an advance beyond its present position as now it stands above the animal stage, then it may be able to understand itself.

*Das Körperliche Gefühl.* KRÖNER, pp. 220, Breslau, 1887.

This is a treatise on the development of the soul, and is based on biological laws. The mental protoplasm, out of which all mental powers have been evolved, is general bodily sensation or feeling. This includes simply the sensations of pleasure or of displeasure. Soul is declared to be wherever sensation intervenes between the stimulus and the reaction. A first group of bodily sensations are those not localizable, such as weariness, sleepiness, hunger, thirst, appetites, modesty, etc., all dependent upon general states of nutrition. This class of com-

mon sensations (*Gemeingefühle*) are first in ontogenetic and phylogenetic development. In the child the sensations received through the special senses are probably transformed into *Gemeingefühle*. The effects of various states of the bodily organs on the feelings of this class is next taken up in order, after which the same effects from stimuli of the special senses. To take an illustration, the flesh of animals is out of flavor during the breeding season. This is due to the absorption of odors. The effects of certain odors may spread very rapidly through the body; this is due, he thinks, to the chemical action of the substances upon the cells. An objection seems possible here that in some cases this effect is so instantaneous as to bar out all idea of the circulation spreading the substance. The effect can be due to nervous radiation only. The effect of odors may be quite soothing or the reverse. The great rôle of sexual odors in arousing passion is referred to.

In the chapter on the Emotions, the result of associations formed by coincidence of certain states and certain objects, it is shown that they may be quite individual, an object inspiring feelings of disgust with one person and of pleasure with another. The effect of ideas in producing bodily changes is dwelt upon. Emotions can't be kept up, the higher the pitch the shorter their life. Temperaments depend on the nature of the *ease* of emotional change, and on the *strength* and the pitch of the resultant feeling. The sanguine temperament is quickly moved to a high pitch, but with little strength in the emotional states. The phlegmatic is slow, low and weak; the choleric, quick, high and strong; the melancholic, slow, high, or low and strong. Even animals have temperament. Common sensations depend on chemical or nutritional changes. Irradiation of pain is due he thinks to the formation of poisonous substances at the spot of injury that spread by osmosis. The cause of sickness when viewing the sun is due to the production of products of disorganization in the over-stimulated cells. This must be taken for a rash conclusion, for reasons similar to those advanced when speaking of odors above. Once the author had occasion to use some dog grease, and no sooner had his dog come near than he was seized with a paroxysm of fear, perhaps says Kröner the dog whose fat was smelled had died in agony, and the chemical products of fear were absorbed by the fat. The effect of smells is often such as to cause the recall of forgotten scenes. Panics may be caused by a sort of odorous contagion. Here we may ask why is it necessary to have a material substance, that is conceived to act by chemical methods. In physics electric vibrations produce inductive effects, and shall we rule out the possibility of similar effects between living bodies. In acoustics we have sympathetic vibrations. A panic is a case of sympathetic action. This view if true will give the basis for an explanation of those cases of thought-transference not otherwise explainable. But thought-transference is a term not applicable, but rather emotional transference or sympathetic response. The case of the mother who after a severe fright nursed her babe and it soon died of convulsions, and all similar well-known cases are of course to be explained on the chemical theory. The effect of the emotions on the secretions of other glands, as tears, sweats, etc., is well known; sad news destroys the appetite. When stimuli are repeated they do not affect protoplasm as did the first one, this is not due to a general weariness of the nerve, for if a different sort of stimuli is used we get a greater effect. This is due to a sort of adaptation, similar to that which takes place in opium usage and other habits where the dose must be constantly strengthened to produce its effects. Tickling offers some curious features that are not easily explainable. Only the *Culturmensch* can be tickled (?) It is a species of shuddering. Pain may be defined as an unusual stimulus, one which the cells have not learned to interpret or meet with proper reaction.

But there are also special paths for pain that give ideas of injurious effects that the body as a whole can control. Natural selection has evolved ideas and memory in those lines only where such psychic activities are useful. For the body in general it has been found sufficient to retain the common sensation of protoplasm.

*Change of Life.* TILT.

Tilt advocates the view that the visceral ganglia are the seat of the emotions and brings much matter of observation of disturbance of these ganglia by the involution of the ovaries. The effects of "gangliopathy" are such as to profoundly disturb the body and cause even insanity. A blow at the pit of the stomach may kill as quickly as a puncture of the *nœud vital*. Note the disturbance of sea-sickness, the vomiting of pregnancy, nightmare and of *globus hystericus*, which latter begins by a sensation rising from the pit of the stomach. This may be caused by continued pressure on the ovaries, and end in convulsions. Hysteria is the "keystone of mental pathology," and if he were lecturing on insanity he would begin with an accurate study of a complete case of hysteria and show the regular steps by which it may culminate in mania and other forms of insanity. "The epileptic aura radiates from the ovaries. Between haziness of intellect and idiocy there are all gradations, between a girl's temper and mania there is no break, and fidgets may pass through hysteria into convulsions. We must go back to Hippocrates who thought the abdominal viscera caused insanity. There is no passion without ganglionic or visceral sensation." These are pregnant words but in extending the realm of the soul from the central nervous system to all nerves, why draw the line here? Nerve cells are part of the same protoplasm, have a common germinal ancestor with all other cells. The fundamental properties of cells are alike. If a cartilage cell does not play so important a part in the psychic activities of the body as a ganglion cell, neither is it situated favorably for such a purpose,—it is not connected by a nerve to an end-organ. Even in the nervous system itself it becomes necessary to distinguish parts that act outside of consciousness. The intellect is indeed produced through the experiences of a special portion of the central nervous system, but this is only one organ of the soul. The greatest philosophers have seen the necessity for extending the realm of the soul. Leibnitz for instance considers every atom to be souled. What idea is denoted by this term soul? The word stands for a philosophic necessity rather than for a definite idea. The problems of science are always pushed back to a threshold where something different from matter must be postulated, something that does not suffer from the limitations of three dimensional space, the law of the conservation of energy and other ideas inseparable from the sensible universe. With reference to such a realm thought must work without images, as for example is the case in the consideration of *non-Euclidian geometry* (geometry of more than three dimensions). From such a standpoint it becomes rational to say that all the hereditary characters are conserved in the egg, though only a few are actually manifested in its structure at any one period of development, and again, that each gemmule contains all the characters of the complete being of which it is a part, often only a transitory part.

*The Soul, or Rational Psychology.* SWEDENBORG, pp. 388. New York, 1887. Translated by Frank Sewall from Dr. Tafel's Latin edition, Tübingen, 1849, from posthumous MS. Upsala, 1742. (Part VII of "The Animal Kingdom.")

The preceding leads us logically to consider the last work on this list for review, which though only relatively modern, is chosen for its rep-